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SECRET

Encl #1 to
DPD 3392-59
COPY 1 OF 1

MEMORANDUM FOR RECORD:

SUBJECT : A Proposal for Using an IR Detection Device to Activate the ELINT Collection System VII Recorders

1. This proposal is being submitted as an alternate method for actuating the System VII Ampex recorders on a demand basis operation. It is felt that if the operation of these recorders could be synchronized with the existence of a specific target that very little, if any, magnetic tape will be wasted on so-called "false alarms". With the present method, utilizing the sync extractor signal, it is quite possible to initiate several "false-starts". Assuming that four or five such alerts occur per mission, this represents a total of 100 feet or better of wasted tape. Although this is only about 2.7% of a total reel of tape, it could possibly become a significant amount if the number of "false alarms" is increased.

2. It is quite possible that the inherent shortcoming of the present extractor to permit signals other than the "B" Type telemetry to filter through can be eliminated. If this is accomplished, the need for the proposed system is quite unnecessary. If, however, the present system continues to be plagued with interfering signals in the frequency range of operation and the problem is incorrigible, it is firmly felt that some serious consideration should be given the alternate method using IR detection.

3. IR detectors which fall within the wave lengths of the radiations emanating from the targets under question, have been developed to a rather high degree of reliability. The range for ICBM's is between 1 and 2 microns (1 micron = 10^{-6} meters). Relatively small IR detector units are available today which have sensitivities of such order to intercept targets, of the ICBM type, at distances greater than 1000 miles. The maximum obtainable line-of-sight distance depends primarily on the altitudes of the two vehicles. When dealing with IR detection geometry, an arbitrary or artificial horizon is assumed somewhere above 30,000 feet. This is imperative, at these wave lengths, in order to reduce the attenuation experienced at the lower altitudes. The atmospheric losses are extremely high at the lower altitudes especially under conditions of dense cloud formations.

25 YEAR RE-REVIEW

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4. Some of the chief advantages of employing IR as the alert medium are: specific target identification, no wasted tape as a result of false triggering, greater search range, possibly greater scan area, and its light weight. The units could be made small enough to provide a right and left side capability. The system could also be stripped of any associated components (navigation, tracking, computer, etc.) leaving only the basic detector and video amplifier. The video signals obtained from the detection of a missile would provide the recorder with the necessary warning time. The activating trigger could be developed by employing an "and" gate using for its inputs the IR and extracted video signals. With this type of circuitry it is necessary to have both inputs, simultaneously in order to produce an output signal.

5. In addition to the already mentioned capabilities, it is possible for such a unit to furnish a very general type bearing on the radiating target. This information could then be forwarded to the vehicle operator in one form or another as a guide in laying out a flight pattern.

6. It is hopefully felt that if the existing method continues to operate on TV or extraneous signals that some serious thought be given to the proposed approach of using IR as the means to accomplish the task. The extended range of this system would offer the operator of the vehicle considerably more time to prepare for the actual ELINT run. Any such pre-warning would greatly enhance the chances of collecting earlier and more signals from a particular missile launching. The operator could be easily alerted by some real simple type of indicator light.

7. Westinghouse, Baird, Aerojet, and countless other companies have already developed or are in the process of developing small, compact units which will perform such jobs effectively and efficiently.

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ELINT Staff

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